UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

DYNAMIC DATA TECHNOLOGIES, LLC, *Plaintiff,* v. **AMAZON.COM, INC.; AMAZON WEB SERVICES, INC.; AMAZON DIGITAL SERVICES, LLC,** *Defendants.*	Civil Action No._____ **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Dynamic Data Technologies, LLC ("Dynamic Data") bring this action and make the following allegations of patent infringement relating to U.S. Patent Nos.: 8,135,073 (the "'073 patent"); 8,073,054 (the "'054 patent"); 6,774,918 (the "'918 patent"); 8,184,689 (the "'689 patent"); 6,996,177 (the "'177 patent"); 8,311,112 (the "'112 patent"); 7,894,529 (the "'529 patent"); 7,519,230 (the "'230 patent"); and 7,571,450 (the "'450 patent"); (collectively, the "patents-in-suit"). Defendants Amazon.com, Inc., Amazon Web Services, Inc., and Amazon Digital Services, LLC (collectively, "Amazon" or "Defendant") infringes each of the patents-in-suit in violation of the patent laws of the United States of America, 35 U.S.C. § 1 *et seq*.

INTRODUCTION

1. Dynamic Data's portfolio of over 1,000 patent assets encompasses core technologies in the field of image and video processing. Dynamic Data's patents arose from the research and development efforts of Koninklijke Philips N.V. ("Philips"). Founded in 1891, for well over a century, Philips pioneered ground breaking technologies, including compact audio cassettes, magnetic resonance imaging (MRI) machines, and compact discs.

2.   In an effort to facilitate the licensing of Philips' foundational technology, Dynamic Data is pursuing remedies for infringement of its patents in venues throughout the world. Contemporaneous to the filing of this Complaint and complaints against other companies selling the technologies claimed by Dynamic Data's patent portfolio, Dynamic Data filed patent enforcement actions against Google LLC,[1] Advanced Micro Devices, Inc.,[2] and Microsoft Corporation[3] in the Peoples Republic of China before the Nanjing Specialized Intellectual Property Tribunal. In addition, Dynamic Data has filed a patent enforcement action against Apple, Inc. in Düsseldorf, Germany.[4]

DYNAMIC DATA'S LANDMARK INVENTIONS

3.   The groundbreaking inventions in image and video processing taught in the patents-in-suit were pioneered by Philips. Video and image processing were at the heart of Philips' business for over fifty years. In 1891, Philips, then known as Philips & Company, was founded in Eindhoven, Netherlands to manufacture carbon-filament lamps.[5] In the 1920s, Philips began to produce vacuum tubes and small radios, which would augur Philips' later entry into video and audio processing.

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[1] Asserting Patent Nos. CN1266944C; CN1333373C; and CN1329870C
(南京专业知识产权法院).

[2] Asserting Patent Nos. CN1303818C; CN1333373C; and CN1266944C
(南京专业知识产权法院).

[3] Asserting Patent Nos. CN1266944C, CN1329870C, and CN1333373C
(南京专业知识产权法院).

[4] Asserting Patent No. EP1520409 (Landgericht Düsseldorf).

[5] Gerard O'Regan, A BRIEF HISTORY OF COMPUTING at 99 (2012).

N.A. Halbertsma, *The Birth of a Lamp Factory In 1891*, PHILIPS TECHNICAL REVIEW, Vol. 23 at 230, 234 (1961).

4.   In 1962, Philips introduced the first audio cassette tape.[6]   A year later, Philips launched a small battery-powered audio tape recorder that used a cassette instead of a loose spool.[7] Philips C-cassette was later used as the first mass storage device for early personal computers in the 1970s and 1980s.
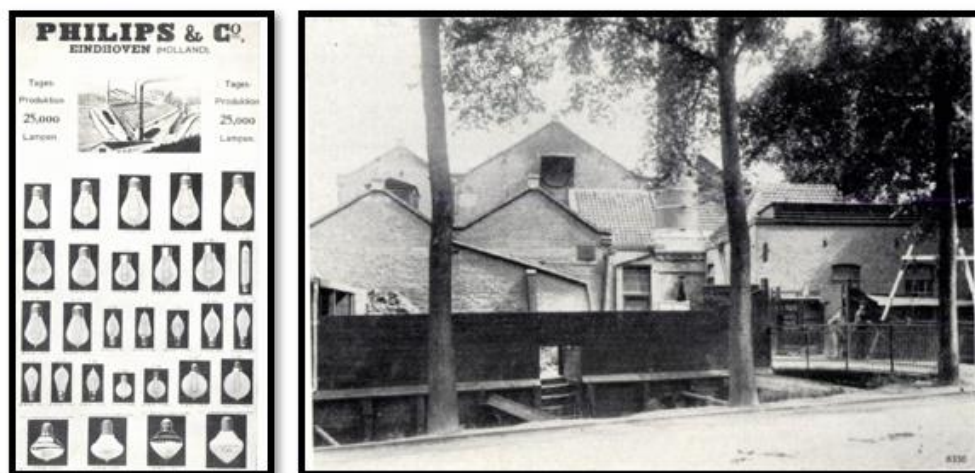

THE ROTARIAN MAGAZINE, Vol. 101 No. 6 at 70 (December 1962) (advertisement showing Philips Norelco device which used cassettes for recording audio for transcription);   Fred Chandler,

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[6] Gerard O'Regan, PILLARS OF COMPUTING: A COMPENDIUM OF SELECT, PIVOTAL TECHNOLOGY FIRMS at 172 (2015) ("Philips invented the compact cassette for audio storage in 1962.")

[7] Anthony Pollard, GRAMOPHONE: THE FIRST 75 YEARS at 231 (1998).

European Mfrs. Bid For Market Share, BILLBOARD MAGAZINE AT P-6 (April 8, 1967) (image of the Philips EL 3300 battery-operated tape recorder which was released in 1963); Jan Syrjala, *Car Stereo: How Does The Music Sound?,* N.Y. TIMES at 2-M (September 25, 1966) (showing Philips's Norelco Cassette "the Philips device has two tiny reels inside it, with the tape traveling from one to the other").

5.   In 1971, Philips demonstrated the world's first videocassette records (VCR). A year later, Philips launched the world's first home video cassette recorder, the N1500. In 1982, Philips teamed with Sony to launch the Compact Disc; this format evolved into the DVD and later Blu-ray, which Philips launched with Sony in 1997 and 2006 respectively.
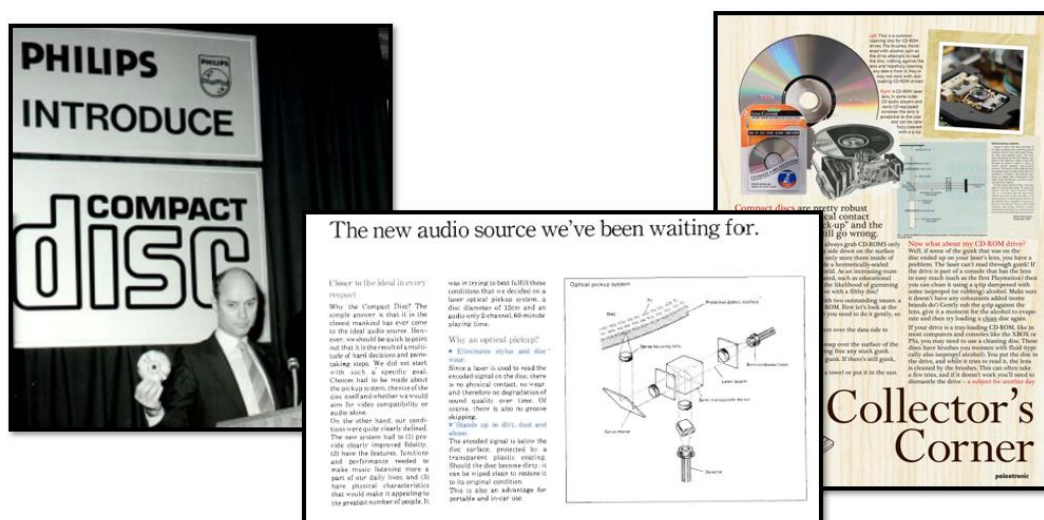
Hans Peek, Jan Bergmans, Jos Van Haaren, Frank Toolenaar, and Sorin Stan, ORIGINS AND SUCCESSORS OF THE COMPACT DISC: CONTRIBUTIONS OF PHILIPS TO OPTICAL STORAGE at 15 (2009) (showing image of Joop Sinjou of Philips introducing the compact disc in March 1979); Advertisements for Philip's Compact Disc Products (1982).

6.   In the late 1990s and early 2000s, Philips pioneered the development of technologies for encoding and decoding of video and audio content. At the time most of the technologies claimed by the patents in Dynamic Data's portfolio were invented, Philips' subsidiary primarily responsible for Philips' work in this field, Philips Semiconductor was the world's sixth

largest semiconductor company.[8]   The video encoding technologies developed by Philips Semiconductor enable video streaming on set-top boxes, smartphones, popular gaming consoles, Internet-connected computers, and numerous other types of media streaming devices.

7.   Philips Semiconductor dedicated significant research and development resources to advancing the technology of video compression and transmission by reducing file sizes and decreasing the processing resources required to transmit the data.[9]   Philips Semiconductor was among the first companies aggressively driving innovation in the field of video processing:

> The late 1980s and early 1990s saw the announcement of several complex, programmable VSPs. Important examples include chips from Matsushita, NTT, Philips [Semiconductors], and NEC.   All of these processors were high-performance parallel processors architected from the ground up for real-time video signal processing. . . . The Philips VSP-1 and NEC processor were probably the most heavily used of these chips.[10]

8.   Starting in the 1960s Philips pioneered the development of audio and video technologies that would establish itself as a leader in the field that would later develop into the audio and video encoding fields. Continuing Philips' pioneering history in these fields, the patents-in-suit disclose cutting-edge video compression and transmission technologies.

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DYNAMIC DATA'S PATENT PORTFOLIO

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9.   Dynamic Data's patent portfolio includes over 1,000 patent assets, with over 400 issued patents granted by patent offices around the world. Dynamic Data owns numerous patents issued by the United States Patent and Trademark Office, including each of the patents-in-suit,

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[8] *Company News; Philips in $1 Billion Deal for VLSI Technology*, THE NEW YORK TIMES (May 4, 1999), *available at*: https://www.nytimes.com/1999/05/04/business/company-news-philips-in-1-billion-deal-for-vlsi-technology.html.

[9] HU, YU HEN, PROGRAMMABLE DIGITAL SIGNAL PROCESSORS: ARCHITECTURE, PROGRAMMING, AND APPLICATIONS, at 190 (Dec. 6, 2001) ("Philips Semiconductors developed early dedicated video chips for specialized video processors.").

[10] *Id.* at 191.

The State Intellectual Property Office of the People's Republic of China,[11] the European Patent Office,[12] the German Patent and Trademark Office,[13] the Japan Patent Office,[14] and many other national patent offices.

10.   Philips Semiconductor's pioneering work in the area of video processing and encoding has resulted in various inventions that are fundamental to today's video processing technologies. Dynamic Data is the owner by assignment of over 1,000 of these patent assets, which include over 400 patents issued by patent offices around the world.

11.   Highlighting the importance of the patents-in-suit is the fact that the patents-in-suit have been cited by over 400 U.S. and international patents and patent applications by a wide variety of the largest companies operating in the field. For example, the patents-in-suit have been cited by companies such as:

- Samsung Electronics Co., Ltd.[15]
- Qualcomm Inc.[16]
- Google LLC[17]
- Intel Corporation[18]
- Broadcom Corporation[19]
- Microsoft Corporation[20]

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[11] *See, e.g.,* CN100504925C; CN100438609C; CN1679052B; CN1333373C; CN1329870C; CN1303818C.

[12] *See, e.g.,* European Patent Nos. EP1032921B1; EP1650978B1; EP1213700B1; EP1520409B1.

[13] *See, e.g.,* German Patent Nos. DE60120762; DE50110537; DE60126151; DE60348978; DE602004049357.

[14] *See, e.g.,* Japanese Patent Nos. JP4583924B2; JP5059855B2; JP5153336B2; JP4637585B2.

[15] *See, e.g.,* U.S. Patent Nos. 6,930,729; 7,911,537; 7,532,764; 8,605,790; and 8,095,887.

[16] *See, e.g.,* U.S. Patent Nos. 7,840,085; 8,649,437; 8,750,387; 8,918,533; 9,185,439; 9,209,934; 9,281,847; 9,319,448; 9,419,749; 9,843,844; 9,917,874; and 9,877,033.

[17] *See, e.g.,* U.S. Patent No. 8,787,454 and U.S. Patent Appl. No. 10/003,793.

[18] *See, e.g.,* U.S. Patent Nos. 7,554,559; 7,362,377; and 8,462,164.

[19] *See, e.g.,* U.S. Patent Nos. 8,325,273 and 9,377,987.

[20] *See, e.g.,* U.S. Patent Nos. 7,453,939; 7,670,227; 7,408,986; 7,421,129; 7,558,320; and 7,929,599.

- Sony Corporation[21]
- Fujitsu Ltd.[22]
- Panasonic Corporation[23]
- Matsushita Electric Industrial Company Limited[24]

THE PARTIES

DYNAMIC DATA TECHNOLOGIES, LLC

12.   Dynamic Data Technologies, LLC ("Dynamic Data" or "Plaintiff") is a limited liability company organized under the laws of Delaware.

13.   In an effort to obtain compensation for Philips' pioneering work in the fields of video data encoding, decoding, and transmission, Dynamic Data acquired the patents-in-suit along with the several hundred additional issued United States and international Patents.

14.   Dynamic Data pursues the reasonable royalties owed for Amazon's use of the inventions claimed in Dynamic Data's patent portfolio, which primarily arise from Philips' groundbreaking technology, both here in the United States and throughout the world.

AMAZON

15.   On information and belief, Amazon.com, Inc. is a Delaware corporation with its principal place of business at 410 Terry Avenue North, Seattle, Washington 98109. Amazon.com, Inc. may be served through its registered agent, Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

16.   On information and belief, Amazon Digital Services, LLC is a Delaware limited liability company with a principal place of business at 410 Terry Avenue North, Seattle,

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[21] *See, e.g.*, U.S. Patent Nos. 7,218,354 and 8,174,615.
[22] *See, e.g.*, U.S. Patent Nos. 7,092,032 and 8,290,308.
[23] *See, e.g.*, U.S. Patent Nos. 8,164,687 and 8,432,495.
[24] *See, e.g.*, U.S. Patent Nos. 7,362,378 and 7,423,961.

Washington 98109. Amazon Digital Services, LLC may be served through its registered agent, Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

17.   On information and belief, Amazon Web Services, Inc. is a Delaware corporation with its principal office at 410 Terry Avenue North, Seattle, Washington 98109. Amazon Web Services, Inc. may be served through its registered agent, Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

18.   Amazon.com, Inc. is the parent company of wholly-owned subsidiaries Amazon Digital Services, LLC and Amazon Web Services, Inc. Amazon.com, Inc., Amazon Digital Services, LLC, and Amazon Web Services, Inc. are collectively referred to herein as "Amazon."

19.   On information and belief, Amazon conducts business operations within the Eastern District of Texas.

20.   On information and belief, Amazon has a regular and established place of business in this District, including, for example, distribution facilities, employees, and contracts and control over third-party businesses providing resources and services to Amazon. For example, Amazon maintains fulfillment centers at 940 W. Bethel Road, Coppell, Texas 75019 and 15201 Heritage Parkway, Fort Worth, Texas 76177.

JURISDICTION AND VENUE

21.   This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has exclusive subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

22.   Upon information and belief, this Court has personal jurisdiction over Amazon in this action because Amazon has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with this forum such that the exercise of

jurisdiction over Amazon would not offend traditional notions of fair play and substantial justice.

Defendant Amazon, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the patents-in-suit. Moreover, Amazon has offices and facilities in the Eastern District of Texas, and actively directs its activities to customers located in the State of Texas.

23.   On information and belief, Amazon has directly financially benefitted from doing business with the State of Texas. For example, Amazon has entered into contract (DIR-TSO-4221) with the State of Texas whereby Amazon is paid by the State of Texas to provide cloud computing and related services.

24.   Venue is proper in this district under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). Defendant Amazon has offices and facilities in the Eastern District of Texas, and upon information and belief, has transacted business in the Eastern District of Texas and has committed acts of direct and indirect infringement in the Eastern District of Texas.

THE ASSERTED PATENTS

U.S. PATENT NO. 8,135,073

25.   U.S. Patent No. 8,135,073 (the "'073 patent") entitled, *Enhancing Video Images Depending On Prior Image Enhancements*, was filed on December 12, 2003, and claims priority to December 19, 2002. The '073 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,799 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '073 patent. A true and correct copy of the '073 patent is attached hereto as Exhibit 1.

26.   The '073 patent discloses novel methods and systems for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation.

27.   The inventions disclosed in the '073 patent reduce the processing capacity required for providing video enhancements to video processing through re-mapping of previous frames for subsequent frames.

28.   Accordingly, the technologies disclosed in the '073 patent enable the provision of enhanced video pictures with minimal additional hardware costs for the components required to successfully process the video data.

29.   The '073 patent discloses a video decoder comprising an input for receiving a video stream containing encoded frame based video information including an encoded first frame and an encoded second frame.

30.   The '073 patent discloses a video decoder comprising an input for receiving video information wherein the encoding of the second frame depends on the encoding of the first frame, the encoding of the second frame includes motion vectors indicating differences in positions between regions of the second frame and corresponding regions of the first frame, the motion vectors define correspondence between regions of the second frame and corresponding regions of the first frame.

31.   The '073 patent discloses a video decoder comprising a decoding unit for decoding the frames, wherein the decoding unit recovers the motion vectors for the second frame.

32.   The '073 patent discloses a video decoder comprising a processing component configured to determine a re-mapping strategy for video enhancement of the decoded first frame using a region-based analysis, re-map the first frame using the re-mapping strategy, and re-map one or more regions of the second frame depending on the re-mapping strategy for corresponding regions of the first frame.

33.   The '073 patent and its underlying patent application have been cited by 36 patents and patent applications as relevant prior art.   Specifically, patents issued to the following companies have cited the '073 patent and its underlying patent application as relevant prior art:

- Canon Inc.
- Microsoft Corporation
- International Business Machines Corporation
- Qualcomm Inc.
- Digital Fountain Incorporated
- Samsung Electronics Co., Ltd.
- SK Planet Co. Ltd.

U.S. PATENT NO. 8,073,054

34.   U.S. Patent No. 8,073,054 (the "'054 patent") entitled, *Unit For And Method Of Estimating A Current Motion Vector*, was filed on December 12, 2002, and claims priority to January 17, 2002. The '054 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,162 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '054 patent. A true and correct copy of the '054 patent is attached hereto as Exhibit 2.

35.   The '054 patent discloses novel methods and apparatuses for estimating a current motion vector for a group of pixels of an image.

36.   The inventions disclosed in the '054 patent enable motion estimation with a relatively fast convergence in finding the appropriate motion vectors of the motion vector fields by adding a further candidate motion vector to the set of candidate motion vectors.

37.   The '054 patent discloses a motion estimation unit comprising a generating unit for generating a set of candidate motion vectors for the group of pixels, with the candidate motion vectors being extracted from a set of previously estimated motion vectors.

38.   The '054 patent discloses a motion estimation unit comprising a match error unit for calculating match errors of respective candidate motion vectors.

39.   The '054 patent discloses a motion estimation unit comprising a selector for selecting the current motion vector from the candidate motion vectors by means of comparing the match errors of the respective candidate motion vectors, characterized in that the motion estimation unit is arranged to add a further candidate motion vector to the set of candidate motion vectors by calculating the further candidate motion vector on basis of a first motion vector and a second motion vector, both belonging to the set of previously estimated motion vectors.

40.   The '054 patent discloses a motion estimation unit that calculates the further candidate motion vector on basis of the first motion vector and the second motion vector, with the first motion vector belonging to a first forward motion vector field and the second motion vector belonging to a second forward motion vector field, with the first forward motion vector field and the second forward motion vector field being different.

41.   The '054 patent discloses a motion estimation unit that arranges to calculate the further candidate motion vector by means of calculating a difference between the second motion vector and the first motion vector.

42.   The '054 patent and its underlying patent application have been cited by 14 patents and patent applications as relevant prior art.   Specifically, patents issued to the following companies have cited the '054 patent and its underlying patent application as relevant prior art:

- Canon Inc.
- Huawei Technologies, Ltd.
- Imagination Technologies Ltd.
- MediaTek Inc.
- Panasonic Corp.
- Samsung Electronics Co., Ltd.
- Siemens Healthcare GmbH
- Tencent Technology (Shenzhen) Co., Ltd.

U.S. PATENT NO. 6,774,918

43.   U.S. Patent No. 6,774,918 ("the '918 patent") entitled, *Video Overlay Processor with Reduced Memory And Bus Performance Requirements*, was filed on June 28, 2000. The '918 patent is subject to a 35 U.S.C. § 154(b) term extension of 591 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '918 patent.   A true and correct copy of the '918 patent is attached hereto as Exhibit 3.

44.   The '918 patent claims specific methods and systems for providing an overlay such as a cursor in an on-screen display in a consumer electronic device. On-screen display (OSD) data for generating an image on a display device are downloaded to an OSD unit on an integrated circuit.

45.   The '918 patent discloses downloading on-screen display (OSD) data for generating an image on a display device.

46.   The '918 patent further discloses downloading the on-screen display (OSD) data in segments separated by gaps.

47.   The '918 patent further discloses, during a gap in downloading the on-screen display data, downloading an amount of overlay data for generating an overlay on the image generated on a display device.

48.   Further, the '918 patent discloses that the overlay data downloaded during a gap comprises a portion of the overlay data.

49.   The inventions disclosed in the '918 patent improve the operation and efficiency of computer components because only a portion of the overlay data is downloaded during each burst gap, thus reducing the amount of memory needed to store the overlay data. The inventions disclosed in the '918 patent further eliminate the requirement that on-chip memory be large enough

to hold the data needed for an entire overlay. Instead, only one line or a part of one line of the overlay needs to be stored on-chip.

50.   The '918 patent claims a technical solution to a problem unique to video processing.

51.   The '918 patent has been cited by several United States patents and patent applications as relevant prior art. Specifically, patents issued to Realtek Semiconductor Corp., Samsung Electronics Co., Ltd., and Thomson Licensing SA have all cited the '918 patent as relevant prior art.

U.S. PATENT NO. 8,184,689

52.   U.S. Patent No. 8,184,689 (the "'689 patent") entitled, *Method Video Encoding And Decoding Preserving Cache Localities*, was filed on August 7, 2006, and claims priority to August 17, 2005. The '689 patent is subject to a 35 U.S.C. § 154(b) term extension of 948 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '689 patent. A true and correct copy of the '689 patent is attached hereto as Exhibit 4.

53.   The '689 patent discloses novel methods and apparatuses for encoding and decoding video data.

54.   The inventions disclosed in the '689 patent processing time and power consumption associated with encoding and decoding video stream data is reduced by reducing off-chip memory accesses through using simultaneous encoded/decoded images as a reference image for encoding/decoding at least one of the other simultaneously encoded/decoded images.

55.   The '689 patent discloses a method for encoding and decoding a video stream, including a plurality of images in a video processing apparatus having a processing unit coupled to a first memory, further comprising a second memory.

56.   The '689 patent discloses a method for encoding and decoding a video stream comprising providing a subset of image data stored in the second memory in the first memory.

57.   The '689 patent discloses a method for encoding and decoding a video stream comprising simultaneous encoding/decoding of more than one image of the video stream, by accessing said subset, wherein the simultaneously encoding/decoding is performed by access sharing to at least one image.

58.   The '689 patent and its underlying patent application have been cited by several patents and patent applications as relevant prior art. Specifically, patents issued to Fujitsu Ltd., Qualcomm Inc., Sony Corporation, Sun Patent Trust, and VIXS Systems Incorporated have all cited the '689 patent and its underlying patent application as relevant prior art.

U.S. PATENT NO. 6,996,177

59.   U.S. Patent No. 6,996,177 (the "'177 patent") entitled, *Motion Estimation*, was filed on July 24, 2000, and claims priority to August 22, 1999. The '177 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,103 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '177 patent. A true and correct copy of the '177 patent is attached hereto as Exhibit 5.

60.   The '177 patent claims specific methods and devices for motion estimation and motion-compensated picture signal processing.

61.   The '177 patent discloses a motion vector estimation method and device that carries out a block-based motion vector estimation process that involves comparing a plurality of candidate vectors to determine block-based motion vectors.

62.   The '177 patent discloses a motion vector estimation method and device that determines at least a most frequently occurring block-based motion vector.

63.   The '177 patent discloses a motion vector estimation method and device that carries out a global motion vector estimation process using at least the most frequently occurring block-based motion vector to obtain a global motion vector.

64.   The '177 patent discloses a motion vector estimation method and device that applies the global motion vector as a candidate vector to the block-based motion vector estimation process.

65.   The inventions disclosed in the '177 patent improve the operation of the computer components necessary to the performance of picture signal processing by reducing the load on the central processing unit.

66.   The '177 patent has been cited by 16 United States and International patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '177 patent as relevant prior art:

- Qualcomm Incorporated
- LG Electronics
- Microsoft Corporation
- Samsung Electronics Co., Ltd.
- VIXS Systems Incorporated
- General Instrument Corporation

U.S. PATENT NO. 8,311,112

67.   U.S. Patent No. 8,311,112 (the "'112 patent") entitled, *System And Method For Video Compression Using Predictive Coding*, was filed on December 31, 2008. The '112 patent is subject to a 35 U.S.C. § 154(b) term extension of 847 days. Dynamic Data is the owner by assignment of all right, title, and interest in the '112 patent. A true and correct copy of the '112 patent is attached hereto as Exhibit 6.

68.   The '112 patent discloses novel methods and systems for video compression.

69.   The '112 patent discloses novel technologies for video compression that perform predictive coding on a macroblock of a video frame such that a set of pixels of the macroblock is coded using some of the pixels from the same video frame as reference pixels and the rest of the macroblock is coded using reference pixels from at least one other video frame.

70.   The '112 patent discloses a system for video compression comprising an intra-frame coding unit configured to perform predictive coding on a set of pixels of a macroblock of pixels using a first group of reference pixels, the macroblock of pixels and the first group of reference pixels being from a video frame.

71.   The '112 patent discloses a system for video compression comprising an inter-frame coding unit configured to perform predictive coding on the rest of the macroblock of pixels using a second group of reference pixels, the second group of reference pixels being from at least one other video frame.

72.   The '112 patent and its underlying patent application have been cited by 10 patents and patent applications as relevant prior art.   Specifically, patents issued to the following companies have cited the '112 patent and its underlying patent application as relevant prior art:

- British Broadcasting Corporation
- Google LLC
- Megachips Corp.
- Olympus Corp.
- Samsung Electronics Co., Ltd.
- Sony Corporation
- Toshiba Corporation

U.S. PATENT NO. 7,894,529

73.   U.S. Patent No. 7,894,529 (the "'529 patent") entitled, *Method And Device For Determining Motion Vectors*, was filed on June 1, 2006, and claims priority to June 3, 2005. The '529 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,301 days. Dynamic Data is the

owner by assignment of all right, title, and interest in the '529 patent. A true and correct copy of the '529 patent is attached hereto as Exhibit 7.

74.   The '529 patent discloses novel methods and apparatuses for determining motion vectors that are each assigned to individual image regions.

75.   The inventions disclosed in the '529 patent enable an increase in the resolution of video and image signals during the motion estimation process.

76.   The '529 patent discloses a method for determining motion vectors which are assigned to individual image regions of an image.

77.   The '529 patent discloses a method wherein an image is subdivided into a number of image blocks, and a motion estimation technique is implemented to assign at least one motion vector to each of the image blocks where a modified motion vector is generated for at least a first image block.

78.   The '529 patent discloses a method that determines at least a second image block through which the motion vector assigned to the first image block at least partially passes.

79.   The '529 patent discloses a method that generates the modified motion vector as a function of a motion vector assigned to at least the second image block.

80.   The '529 patent discloses a method that assigns the modified motion vector as the motion vector to the first image block.

81.   The '529 patent and its underlying patent application have been cited by multiple patents and patent applications as relevant prior art. Specifically, patents issued to Fujifilm Corp., and Samsung Electronics Co., Ltd. have cited the '529 patent and its underlying patent application as relevant prior art.

U.S. PATENT NO. 7,519,230

82.   U.S. Patent No. 7,519,230 (the "'230 patent") entitled, *Background Motion Vector Detection*, was filed on December 16, 2003, and claims priority to January 23, 2003. The '230 patent is subject to a 35 U.S.C. § 154(b) term extension of 685 days. Dynamic Data is the owner of all right, title, and interest in the '230 patent. A true and correct copy of the '230 patent is attached hereto as Exhibit 8.

83.   The '230 patent claims specific methods and systems to select a background motion vector for a pixel in an occlusion region of an image.

84.   The '230 patent discloses systems and methods determine the correct motion vector in occlusion regions, thereby reducing or eliminating artifacts of motion compensated image rate converters, which are referred to as "halos" in the display of video images.

85.   The '230 patent claims a method of selecting a background motion vector for a pixel in an occlusion region of an image comprising computing a model-based motion vector for the pixel on basis of a motion model being determined on basis of a part of a motion vector field of the image.

86.   The '230 patent claims a method of selecting a background motion vector for a pixel in an occlusion region of an image comprising comparing the model-based motion vector with each of the motion vectors of the set of motion vectors.

87.   The '230 patent claims a method of selecting a background motion vector for a pixel in an occlusion region of an image comprising selecting a particular motion vector of the set of motion vectors on basis of the comparing and for assigning the particular motion vector as the background motion vector.

88.   The '230 patent has been cited by 28 United States and international patents and

patent applications as relevant prior art. Specifically, patents issued to the following companies

have cited the '230 patent as relevant prior art:

- Sony Corporation
- Fujitsu Ltd.
- Motorola Solutions Inc.
- Nokia Oyj
- Qualcomm Inc.
- Samsung Electronics Co., Ltd.
- Toshiba Corporation

U.S. PATENT NO. 7,571,450

89.   U.S. Patent No. 7,571,450 (the "'450 patent") entitled, *System For And Method Of*

Displaying Information, was filed on February 12, 2003, and claims priority to March 11, 2002.

The '450 patent is subject to a 35 U.S.C. § 154(b) term extension of 846 days. Dynamic Data is

the owner by assignment of all right, title, and interest in the '450 patent. A true and correct copy

of the '450 patent is attached hereto as Exhibit 9.

90.   The '450 patent discloses novel methods and systems for displaying information.

The inventions disclosed in the '450 patent enable methods and systems wherein a user does not

need to make a new selection after being switched from one service to a second service.

91.   The inventions disclosed in the '450 patent permit a user of an information display

system to have selections made on a first service also presented when the user switches to a second

service without requiring the user to browse through the menus to define the type of information

to be displayed a second time.

92.   In one embodiment of the '450 patent, the user selection being made on the basis

of the provided options while the first service was selected is use to select the appropriate data

elements of the stream of the second service.

93.   The inventions disclosed in the '450 patent enable various content sources to share similar information models.

94.   The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein receiving a transport stream comprises services, with the services having elementary streams of video and of data elements.

95.   The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein user actions of making a user selection of a type of information to be displayed on the device are received.

96.   The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein filtering to select a data element of a first one of the services on the basis of the user selection is performed.

97.   The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein rendering to calculate an output image to be displayed on the display device, on the basis of the first data element selected by the filer is performed.

98.   The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein switching from the first one of the services to a second one of the services, characterized in comprising a second step of filtering to select a second data-element of the second one of the services, on basis of the user selection is performed.

99.   The '450 patent, in one embodiment, discloses a method of displaying information on a display device wherein being switched from the first one of the services to the second one of the services, with the data-element and the second data-element being mutually semantically related and a second step of rendering to calculate the output image to be displayed on the display device, on basis of the second data-element selected by the filter is performed.

100.   The '450 patent and its underlying patent application have been cited by several patents and patent applications as relevant prior art. Specifically, patents issued to AT&T Intellectual Property I LP, Nokia Oyj, Samsung Electronics Co., Ltd., and ZTE Corporation have all cited the '450 patent and its underlying patent application as relevant prior art.

COUNT I
INFRINGEMENT OF U.S. PATENT NO. 8,135,073

101.   Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

102.   Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation.

103.   Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon devices that contain H.265 decoding functionality, including: the Amazon Web Services platform (e.g., AWS Elastic Transcoder, AWS Elemental MediaConvert, AWS Elemental MediaLive, Amazon EC2 Accelerated Compute (EC2 G3 Instances), Amazon CloudFront); Amazon Fire TV products (e.g., Fire TV Stick 4k, Fire TV Cube, Fire TV (Gen 3), Fire TV (Gen 2), Fire TV Edition - Toshiba 4K (2018), Fire TV Edition - Element 4K (2018), Fire TV Edition - Insignia HD (2018), Fire TV Edition - Insignia 4k (2018), Fire TV Edition - Toshiba HD (2018)); and Amazon Fire Tablet products (e.g., Fire HD 8 (2018), Fire HD 10 (2017), Fire HD 8 (2017), Fire 7 (2017), Fire HD 8 (2016), Fire HD 8 (2015), Fire HD 10 (2015)) (collectively, the "Amazon '073 Product(s)").

104.   On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '073 Products in regular business operations.

105.   On information and belief, one or more of the Amazon '073 Products include technology for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation.

106.   On information and belief, Amazon has directly infringed and continues to directly infringe the '073 patent by, among other things, making, using, offering for sale, and/or selling technology for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation, including but not limited to the Amazon '073 Products.

107.   On information and belief, one or more of the Amazon '073 Products reduce the processing capacity required for providing video enhancements to video processing through re-mapping of previous frames for subsequent frames.

108.   On information and belief, one or more of the Amazon '073 Products enable the provision of enhanced video pictures with minimal additional hardware costs for the components required to successfully process the video data.

109.   On information and belief, one or more of the Amazon '073 Products include an input for receiving a video stream containing encoded frame based video information including an encoded first frame and an encoded second frame.

110.   On information and belief, one or more of the Amazon '073 Products include a video decoder comprising an input for receiving video information wherein the encoding of the second frame depends on the encoding of the first frame, the encoding of the second frame includes motion vectors indicating differences in positions between regions of the second frame and corresponding regions of the first frame, the motion vectors define correspondence between regions of the second frame and corresponding regions of the first frame.

111.   On information and belief, one or more of the Amazon '073 Products include a video decoder comprising a decoding unit for decoding the frames, wherein the decoding unit recovers the motion vectors for the second frame.

112.   On information and belief, one or more of the Amazon '073 Products include a video decoder comprising a processing component configured to determine a re-mapping strategy for video enhancement of the decoded first frame using a region-based analysis, re-map the first frame using the re-mapping strategy, and re-map one or more regions of the second frame depending on the re-mapping strategy for corresponding regions of the first frame.

113.   On information and belief, the Amazon '073 Products are available to businesses and individuals throughout the United States.

114.   On information and belief, the Amazon '073 Products are provided to businesses and individuals located in the Eastern District of Texas.

115.   By making, using, testing, offering for sale, and/or selling products and services for enhancing subsequent images of a video stream in which frames are encoded based on previous frames using prediction and motion estimation, including but not limited to the Amazon '037 Products, Amazon has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '073 patent, including at least claim 14 pursuant to 35 U.S.C. § 271(a).

116.   On information and belief, Amazon also indirectly infringes the '073 patent by actively inducing infringement under 35 USC § 271(b).

117.   Amazon has had knowledge of the '073 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '073 patent and knew of its infringement, including by way of this lawsuit.

118.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '073 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '073 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '073 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '073 Products that have the capability of operating in a manner that infringe one or more of the claims of the '073 patent, including at least claim 14, and Amazon further provides documentation and training materials that cause customers and end users of the Amazon '073 Products to utilize the products in a manner that directly infringe one or more claims of the '073 patent.[25] By providing instruction and training to customers and end-users on how to use the Amazon '073 Products in a manner that directly infringes one or more claims of the '073 patent, including at least claim 14, Amazon specifically intended to induce infringement of the '073 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '073 Products, e.g., through Amazon user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '073 patent. Accordingly, Amazon has induced and continues to induce users of the

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[25] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *Fire TV Stick*, AMAZON USER GUIDE; *Watching Video in 4K Ultra HD on Fire TV*, AMAZON HELP WEBSITE, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=201859000 (last visited Nov. 2018); *Amazon Fire TV*, AMAZON USER GUIDE; *Amazon Fire Tablet and Kindle E-Reader Quick Setup Guide*, AMAZON USER GUIDE (2014); *Fire & Kindle User's Guides*, Amazon Help Website, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=200317150 (last visited Nov. 2018).

accused products to use the accused products in their ordinary and customary way to infringe the '073 patent, knowing that such use constitutes infringement of the '073 patent.

119.   The '073 patent is well-known within the industry as demonstrated by multiple citations to the '073 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '073 patent without paying a reasonable royalty. Amazon is infringing the '073 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

120.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '073 patent.

121.   As a result of Amazon's infringement of the '073 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

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COUNT II
INFRINGEMENT OF U.S. PATENT NO. 8,073,054

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122.   Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

123.   Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for estimating a current motion vector for a group of pixels of an image.

124.   Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon products that contain H.265 encoding functionality, including: the Amazon Web Services platform (e.g., AWS Elemental MediaConvert, AWS Elemental MediaLive, Amazon EC2 Accelerated Compute

(EC2 G3 Instances), Amazon CloudFront); Amazon Fire TV products (e.g., Fire TV Stick 4k, Fire TV Cube, Fire TV (Gen 3)) (collectively, the "Amazon '054 Product(s)").

125. On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '054 Products in regular business operations.

126. On information and belief, one or more of the Amazon '054 Products include technology for estimating a current motion vector for a group of pixels of an image.

127. On information and belief, Amazon has directly infringed and continues to directly infringe the '054 patent by, among other things, making, using, offering for sale, and/or selling technology for estimating a current motion vector for a group of pixels of an image, including but not limited to the Amazon '054 Products.

128. On information and belief, one or more of the Amazon '054 Products enable motion estimation with a relatively fast convergence in finding the appropriate motion vectors of the motion vector fields by adding a further candidate motion vector to the set of candidate motion vectors.

129. On information and belief, one or more of the Amazon '054 Products include a motion estimation unit comprising a generating unit for generating a set of candidate motion vectors for the group of pixels, with the candidate motion vectors being extracted from a set of previously estimated motion vectors.

130. On information and belief, one or more of the Amazon '054 Products include a motion estimation unit comprising a match error unit for calculating match errors of respective candidate motion vectors.

131. On information and belief, one or more of the Amazon '054 Products include a motion estimation unit comprising a selector for selecting the current motion vector from the

candidate motion vectors by means of comparing the match errors of the respective candidate motion vectors, characterized in that the motion estimation unit is arranged to add a further candidate motion vector to the set of candidate motion vectors by calculating the further candidate motion vector on basis of a first motion vector and a second motion vector, both belonging to the set of previously estimated motion vectors.

132.   On information and belief, one or more of the Amazon '054 Products include a motion estimation unit that calculates the further candidate motion vector on basis of the first motion vector and the second motion vector, with the first motion vector belonging to a first forward motion vector field and the second motion vector belonging to a second forward motion vector field, with the first forward motion vector field and the second forward motion vector field being different.

133.   On information and belief, one or more of the Amazon '054 Products include a motion estimation unit that arranges to calculate the further candidate motion vector by means of calculating a difference between the second motion vector and the first motion vector.

134.   On information and belief, the Amazon '054 Products are available to businesses and individuals throughout the United States.

135.   On information and belief, the Amazon '054 Products are provided to businesses and individuals located in the Eastern District of Texas.

136.   By making, using, testing, offering for sale, and/or selling products and services for estimating a current motion vector for a group of pixels of an image, including but not limited to the Amazon '054 Products, Amazon has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '054 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

137.   On information and belief, Amazon also indirectly infringes the '054 patent by actively inducing infringement under 35 USC § 271(b).

138.   Amazon has had knowledge of the '054 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '054 patent and knew of its infringement, including by way of this lawsuit.

139.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '054 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '054 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '054 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '054 Products that have the capability of operating in a manner that infringe one or more of the claims of the '054 patent, including at least claim 1, and Amazon further provides documentation and training materials that cause customers and end users of the Amazon '054 Products to utilize the products in a manner that directly infringe one or more claims of the '054 patent.[26] By providing instruction and training to customers and end-users on how to use the Amazon '054 Products in a manner that directly infringes one or more claims of the '054 patent, including at least claim 1, Amazon specifically intended to induce infringement

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[26] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *Fire TV Stick*, AMAZON USER GUIDE; *Watching Video in 4K Ultra HD on Fire TV*, AMAZON HELP WEBSITE, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=201859000 (last visited Nov. 2018); *Amazon Fire TV*, AMAZON USER GUIDE.

of the '054 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '054 Products, e.g., through Amazon user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '054 patent. Accordingly, Amazon has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '054 patent, knowing that such use constitutes infringement of the '054 patent.

140.   The '054 patent is well-known within the industry as demonstrated by multiple citations to the '054 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '054 patent without paying a reasonable royalty. Amazon is infringing the '054 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

141.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '054 patent.

142.   As a result of Amazon's infringement of the '054 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 6,774,918

143.   Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

144.   Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for image processing.

145.   Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon image processing products, including: the Amazon Web Services platform (e.g., AWS Elastic Transcoder, AWS Elemental MediaConvert, AWS Elemental MediaLive, Amazon CloudFront); Amazon Fire TV products (e.g., Fire TV Stick 4k, Fire TV Cube, Fire TV (Gen 3), Fire TV (Gen 2), Fire TV Edition - Toshiba 4K (2018), Fire TV Edition - Element 4K (2018), Fire TV Edition - Insignia HD (2018), Fire TV Edition - Insignia 4k (2018), Fire TV Edition - Toshiba HD (2018)); and Amazon Fire Tablet products (e.g., (Fire HD 8 (2018), Fire HD 10 (2017), Fire HD 8 (2017), Fire 7 (2017), Fire HD 8 (2016), Fire (2015), Fire HD 8 (2015), Fire HD 10 (2015), Fire HDX 8.9 (2014), Fire HD 7 (2014), Fire HD 6 (2014), Kindle Fire HDX 8.9 (2013), Kindle Fire HDX (2013), Kindle Fire HD (2013), Kindle Fire HD 8.9 (2012), Kindle Fire HD (2012), Kindle Fire (2012), Kindle Fire (2011)) (collectively, the "Amazon '918 Product(s)").

146.   On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '918 Products in regular business operations.

147.   On information and belief, one or more of the Amazon '918 Products include technology for image processing.

148.   On information and belief, the Amazon '918 Products are available to businesses and individuals throughout the United States.

149.   On information and belief, the Amazon '918 Products are provided to businesses and individuals located in the Eastern District of Texas.

150.   On information and belief, Amazon has directly infringed and continues to directly infringe the '918 patent by, among other things, making, using, offering for sale, and/or selling video processing technology, including but not limited to the Amazon '918 Products.

151.   On information and belief, one or more of the Amazon '918 Products provide an overlay such as a cursor in an on-screen display in a consumer electronic device.

152.   On information and belief, one or more of the Amazon '918 Products enable downloading on-screen display (OSD) data for generating an image on a display device.

153.   On information and belief, one or more of the Amazon '918 Products download the on-screen display (OSD) data in segments separated by gaps.

154.   On information and belief, one or more of the Amazon '918 Products download, during a gap in downloading the on-screen display data, an amount of overlay data for generating an overlay on the image generated on a display device.

155.   On information and belief, one or more of the Amazon '918 Products contain overlay data downloaded during a gap that comprises a portion of the overlay data.

156.   On information and belief, the Amazon '918 Products comprise a computer-usable medium having computer-readable program code embodied therein for causing a video processor to download on-screen display (OSD) data for generating an image on a display device, with said downloading occurring in segments separated by gaps.

157.   On information and belief, the Amazon '918 Products comprise a computer-usable medium having computer-readable program code embodied therein for causing a video processor to download an amount of overlay data for generating an overlay on an image during a gap in downloading the on-screen display (OSD) data, wherein the amount of overlay data comprises a portion of said overlay.

158.   By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Amazon '918 Products, Amazon has injured Dynamic Data and is liable for directly infringing one or more claims of the '918 patent, including at least claim 18, pursuant to 35 U.S.C. § 271(a).

159.   On information and belief, Amazon also indirectly infringes the '918 patent by actively inducing infringement under 35 USC § 271(b).

160.   On information and belief, Amazon has had knowledge of the '918 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '918 patent and knew of its infringement, including by way of this lawsuit.

161.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '918 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '918 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '918 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '918 Products that have the capability of operating in a manner that infringe one or more of the claims of the '918 patent, including at least claim 18, and Amazon further provides documentation and training materials that cause customers and end users of the Amazon '918 Products to utilize the products in a manner that directly infringe one or more claims of the '918 patent.[27] By providing instruction and training to customers and end-users on

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[27] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *Fire TV Stick*, AMAZON USER GUIDE; *Watching*

how to use the Amazon '918 Products in a manner that directly infringes one or more claims of the '918 patent, including at least claim 18, Amazon specifically intended to induce infringement of the '918 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '918 Products, e.g., through Amazon user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '918 patent. Accordingly, Amazon has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '918 patent, knowing that such use constitutes infringement of the '918 patent.

162.   The '918 patent is well-known within the industry as demonstrated by multiple citations to the '918 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '918 patent without paying a reasonable royalty. Amazon is infringing the '918 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

163.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '918 patent.

164.   As a result of Amazon's infringement of the '918 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

Video in 4K Ultra HD on Fire TV, AMAZON HELP WEBSITE, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=201859000 (last visited Nov. 2018); *Amazon Fire TV*, AMAZON USER GUIDE; *Amazon Fire Tablet and Kindle E-Reader Quick Setup Guide*, AMAZON USER GUIDE (2014); *Fire & Kindle User's Guides*, Amazon Help Website, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=200317150 (last visited Nov. 2018).

COUNT IV
INFRINGEMENT OF U.S. PATENT NO. 8,184,689

165.   Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

166.   Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for encoding and decoding video data.

167.   Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon products that encode and/or decode video data, including: the Amazon Web Services platform (e.g., AWS Elastic Transcode) and Amazon's streaming products/services (e.g., Amazon Video and Amazon Instant Video) (collectively, the "Amazon '689 Product(s)").

168.   On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '689 Products in regular business operations.

169.   On information and belief, one or more of the Amazon '689 Products include technology for encoding and decoding video data.

170.   On information and belief, Amazon has directly infringed and continues to directly infringe the '689 patent by, among other things, making, using, offering for sale, and/or selling technology for encoding and decoding video data, including but not limited to the Amazon '689 Products.

171.   On information and belief, one or more of the Amazon '689 Products reduce processing time and power consumption associated with encoding and decoding video stream data by reducing off-chip memory accesses through using simultaneous encoded/decoded images as a reference image for encoding/decoding at least one of the other simultaneously encoded/decoded images.

172.   On information and belief, one or more of the Amazon '689 Products perform a method for encoding and decoding a video stream, including a plurality of images in a video processing apparatus having a processing unit coupled to a first memory, further comprising a second memory.

173.   On information and belief, one or more of the Amazon '689 Products perform a method for encoding and decoding a video stream comprising providing a subset of image data stored in the second memory in the first memory.

174.   On information and belief, one or more of the Amazon '689 Products perform a method for encoding and decoding a video stream comprising simultaneous encoding/decoding of more than one image of the video stream, by accessing said subset, wherein the simultaneously encoding/decoding is performed by access sharing to at least one image.

175.   On information and belief, the Amazon '689 Products are available to businesses and individuals throughout the United States.

176.   On information and belief, the Amazon '689 Products are provided to businesses and individuals located in the Eastern District of Texas.

177.   By making, using, testing, offering for sale, and/or selling products and services for encoding and decoding video data, including but not limited to the Amazon '689 Products, Amazon has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '689 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

178.   On information and belief, Amazon also indirectly infringes the '689 patent by actively inducing infringement under 35 USC § 271(b).

179.   Amazon has had knowledge of the '689 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '689 patent and knew of its infringement, including by way of this lawsuit.

180.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '689 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '689 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '689 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '689 Products that have the capability of operating in a manner that infringe one or more of the claims of the '689 patent, including at least claim 1, and Amazon further provides documentation and training materials that cause customers and end users of the Amazon '689 Products to utilize the products in a manner that directly infringe one or more claims of the '689 patent.[28] By providing instruction and training to customers and end-users on how to use the Amazon '689 Products in a manner that directly infringes one or more claims of the '689 patent, including at least claim 1, Amazon specifically intended to induce infringement of the '689 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '689 Products, e.g., through Amazon user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to

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[28] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *AWS Elemental Media Package*, AWS User Guide (2018); *Global Content Guide v6.0*, PRIME VIDEO GUIDE (Aug. 15, 2018); *Global Content Guide v5.2.2*, PRIME VIDEO GUIDE (March 13, 2018).

infringe the '689 patent. Accordingly, Amazon has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '689 patent, knowing that such use constitutes infringement of the '689 patent.

181.   The '689 patent is well-known within the industry as demonstrated by multiple citations to the '689 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '689 patent without paying a reasonable royalty. Amazon is infringing the '689 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

182.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '689 patent.

183.   As a result of Amazon's infringement of the '689 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

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COUNT V
INFRINGEMENT OF U.S. PATENT NO. 6,996,177

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184.   Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

185.   Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for motion estimation.

186.   Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon products that contain H.265 encoding functionality, including: the Amazon Web Services platform (e.g.,

AWS Elemental MediaConvert, AWS Elemental MediaLive, Amazon EC2 Accelerated Compute (EC2 G3 Instances), Amazon CloudFront); Amazon Fire TV products (e.g., Fire TV Stick 4k, Fire TV Cube, Fire TV (Gen 3)) (collectively, the "Amazon '177 Product(s)").

187.   On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '177 Products in regular business operations.

188.   On information and belief, one or more of the Amazon '177 Products include technology for motion estimation and motion-compensated picture signal processing.

189.   On information and belief, the Amazon '177 Products are available to businesses and individuals throughout the United States.

190.   On information and belief, the Amazon '177 Products are provided to businesses and individuals located in the Eastern District of Texas.

191.   On information and belief, Amazon has directly infringed and continues to directly infringe the '177 patent by, among other things, making, using, offering for sale, and/or selling products and services for motion estimation and motion-compensated picture signal processing.

192.   The Amazon '177 Products comprise methods and devices for motion estimation and motion-compensated picture signal processing.

193.   The Amazon '177 Products incorporate a motion vector estimation method and device that carries out a block-based motion vector estimation process that involves comparing a plurality of candidate vectors to determine block-based motion vectors.

194.   The Amazon '177 Products determine at least a most frequently occurring block-based motion vector.

195.   The Amazon '177 Products carry out a global motion vector estimation process using at least the most frequently occurring block-based motion vector to obtain a global motion vector.

196.   The Amazon '177 Products applies the global motion vector as a candidate vector to the block-based motion vector estimation process.

197.   By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Amazon '177 Products, Amazon has injured Dynamic Data and is liable for directly infringing one or more claims of the '177 patent, including at least claim 1, pursuant to 35 U.S.C. § 271(a).

198.   On information and belief, Amazon also indirectly infringes the '177 patent by actively inducing infringement under 35 USC § 271(b).

199.   On information and belief, Amazon has had knowledge of the '177 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '177 patent and knew of its infringement, including by way of this lawsuit.

200.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '177 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '177 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '177 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '177 Products that have the capability of operating in a manner that infringe one or more of the claims of the '177 patent, including at least claim 1, and

Amazon further provides documentation and training materials that cause customers and end users of the Amazon '177 Products to utilize the products in a manner that directly infringe one or more claims of the '177 patent.[29] By providing instruction and training to customers and end-users on how to use the Amazon '177 Products in a manner that directly infringes one or more claims of the '177 patent, including at least claim 1, Amazon specifically intended to induce infringement of the '177 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '177 Products, e.g., through Amazon user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '177 patent. Accordingly, Amazon has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '177 patent, knowing that such use constitutes infringement of the '177 patent.

201.   The '177 patent is well-known within the industry as demonstrated by multiple citations to the '177 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '177 patent without paying a reasonable royalty. Amazon is infringing the '177 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

202.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '177 patent.

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[29] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *Fire TV Stick*, AMAZON USER GUIDE; *Watching Video in 4K Ultra HD on Fire TV*, AMAZON HELP WEBSITE, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=201859000 (last visited Nov. 2018); *Amazon Fire TV*, AMAZON USER GUIDE.

203.   As a result of Amazon's infringement of the '177 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

<u>COUNT VI</u>
<u>INFRINGEMENT OF U.S. PATENT NO. 8,311,112</u>

204.   Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

205.   Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for video compression.

206.   Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon products that contain H.265 encoding functionality, including: the Amazon Web Services platform (e.g., AWS Elemental MediaConvert, AWS Elemental MediaLive, Amazon EC2 Accelerated Compute (EC2 G3 Instances), Amazon CloudFront); Amazon Fire TV products (e.g., Fire TV Stick 4k, Fire TV Cube, Fire TV (Gen 3)) (collectively, the "Amazon '112 Product(s)").

207.   On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '112 Products in regular business operations.

208.   On information and belief, one or more of the Amazon '112 Products include technology for video compression.

209.   On information and belief, Amazon has directly infringed and continues to directly infringe the '112 patent by, among other things, making, using, offering for sale, and/or selling technology for video compression, including but not limited to the Amazon '112 Products.

210.   On information and belief, one or more of the Amazon '112 Products perform predictive coding on a macroblock of a video frame such that a set of pixels of the macroblock is coded using some of the pixels from the same video frame as reference pixels and the rest of the macroblock is coded using reference pixels from at least one other video frame.

211.   On information and belief, one or more of the Amazon '112 Products include a system for video compression comprising an intra-frame coding unit configured to perform predictive coding on a set of pixels of a macroblock of pixels using a first group of reference pixels, the macroblock of pixels and the first group of reference pixels being from a video frame.

212.   On information and belief, one or more of the Amazon '112 Products include a system for video compression comprising an inter-frame coding unit configured to perform predictive coding on the rest of the macroblock of pixels using a second group of reference pixels, the second group of reference pixels being from at least one other video frame.

213.   On information and belief, the Amazon '112 Products are available to businesses and individuals throughout the United States.

214.   On information and belief, the Amazon '112 Products are provided to businesses and individuals located in the Eastern District of Texas.

215.   By making, using, testing, offering for sale, and/or selling products and services for interpolating a pixel during the interlacing of a video signal, including but not limited to the Amazon '112 Products, Amazon has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '112 patent, including at least claim 11 pursuant to 35 U.S.C. § 271(a).

216.   On information and belief, Amazon also indirectly infringes the '112 patent by actively inducing infringement under 35 USC § 271(b).

217.   Amazon has had knowledge of the '112 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '112 patent and knew of its infringement, including by way of this lawsuit.

218.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '112 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '112 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '112 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '112 Products that have the capability of operating in a manner that infringe one or more of the claims of the '112 patent, including at least claim 11, and Amazon further provides documentation and training materials that cause customers and end users of the Amazon '112 Products to utilize the products in a manner that directly infringe one or more claims of the '112 patent.[30] By providing instruction and training to customers and end-users on how to use the Amazon '112 Products in a manner that directly infringes one or more claims of the '112 patent, including at least claim 11, Amazon specifically intended to induce infringement of the '112 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '112 Products, e.g., through Amazon user manuals, product support,

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[30] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *Fire TV Stick*, AMAZON USER GUIDE; *Watching Video in 4K Ultra HD on Fire TV*, AMAZON HELP WEBSITE, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=201859000 (last visited Nov. 2018); *Amazon Fire TV*, AMAZON USER GUIDE.

marketing materials, and training materials to actively induce the users of the accused products to infringe the '112 patent. Accordingly, Amazon has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '112 patent, knowing that such use constitutes infringement of the '112 patent.

219.   The '112 patent is well-known within the industry as demonstrated by multiple citations to the '112 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '112 patent without paying a reasonable royalty. Amazon is infringing the '112 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

220.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '112 patent.

221.   As a result of Amazon's infringement of the '112 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

COUNT VII
INFRINGEMENT OF U.S. PATENT NO. 7,894,529

222.   Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

223.   Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for determining motion vectors that are each assigned to individual image regions.

224.   Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon products that contain H.265 encoding functionality, including: the Amazon Web Services platform (e.g., AWS Elemental MediaConvert, AWS Elemental MediaLive, Amazon EC2 Accelerated Compute (EC2 G3 Instances), Amazon CloudFront); Amazon Fire TV products (e.g., Fire TV Stick 4k, Fire TV Cube, Fire TV (Gen 3)) (collectively, the "Amazon '529 Product(s)").

225.   On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '529 Products in regular business operations.

226.   On information and belief, one or more of the Amazon '529 Products include technology for determining motion vectors that are each assigned to individual image regions.

227.   On information and belief, Amazon has directly infringed and continues to directly infringe the '529 patent by, among other things, making, using, offering for sale, and/or selling technology for determining motion vectors that are each assigned to individual image regions, including but not limited to the Amazon '529 Products.

228.   On information and belief, one or more of the Amazon '529 Products enable an increase in the resolution of video and image signals during the motion estimation process.

229.   On information and belief, one or more of the Amazon '529 Products perform a method for determining motion vectors which are assigned to individual image regions of an image.

230.   On information and belief, one or more of the Amazon '529 Products perform a method wherein an image is subdivided into a number of image blocks, and a motion estimation technique is implemented to assign at least one motion vector to each of the image blocks where a modified motion vector is generated for at least a first image block.

231.   On information and belief, one or more of the Amazon '529 Products perform a method that determines at least a second image block through which the motion vector assigned to the first image block at least partially passes.

232.   On information and belief, one or more of the Amazon '529 Products perform a method that generates the modified motion vector as a function of a motion vector assigned to at least the second image block.

233.   On information and belief, one or more of the Amazon '529 Products perform a method that assigns the modified motion vector as the motion vector to the first image block.

234.   On information and belief, the Amazon '529 Products are available to businesses and individuals throughout the United States.

235.   On information and belief, the Amazon '529 Products are provided to businesses and individuals located in the Eastern District of Texas.

236.   By making, using, testing, offering for sale, and/or selling products and services for interpolating a pixel during the interlacing of a video signal, including but not limited to the Amazon '529 Products, Amazon has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '529 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

237.   On information and belief, Amazon also indirectly infringes the '529 patent by actively inducing infringement under 35 USC § 271(b).

238.   Amazon has had knowledge of the '529 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '529 patent and knew of its infringement, including by way of this lawsuit.

239.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '529 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '529 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '529 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '529 Products that have the capability of operating in a manner that infringe one or more of the claims of the '529 patent, including at least claim 1, and Amazon further provides documentation and training materials that cause customers and end users of the Amazon '529 Products to utilize the products in a manner that directly infringe one or more claims of the '529 patent.[31] By providing instruction and training to customers and end-users on how to use the Amazon '529 Products in a manner that directly infringes one or more claims of the '529 patent, including at least claim 1, Amazon specifically intended to induce infringement of the '529 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '529 Products, e.g., through Amazon user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '529 patent. Accordingly, Amazon has induced and continues to induce users of the

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[31] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *Fire TV Stick*, AMAZON USER GUIDE; *Watching Video in 4K Ultra HD on Fire TV*, AMAZON HELP WEBSITE, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=201859000 (last visited Nov. 2018); *Amazon Fire TV*, AMAZON USER GUIDE.

accused products to use the accused products in their ordinary and customary way to infringe the '529 patent, knowing that such use constitutes infringement of the '529 patent.

240. The '529 patent is well-known within the industry as demonstrated by multiple citations to the '529 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '529 patent without paying a reasonable royalty. Amazon is infringing the '529 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

241. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '529 patent.

242. As a result of Amazon's infringement of the '529 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

COUNT VIII
INFRINGEMENT OF U.S. PATENT NO. 7,519,230

243. Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

244. Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for selecting a background motion vector for a pixel in an occlusion region of an image.

245. Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon products that implement the VP9 encoding functionality, including: the Amazon Web Services platform

(e.g., AWS Elastic Transcoder) and Amazon Fire TVs (e.g., Fire TV Stick 4k) (collectively, the "Amazon '230 Product(s)").

246.   On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '230 Products in regular business operations.

247.   On information and belief, one or more of the Amazon '230 Products include technology for selecting a background motion vector for a pixel in an occlusion region of an image.

248.   On information and belief, the Amazon '230 Products are available to businesses and individuals throughout the United States.

249.   On information and belief, the Amazon '230 Products are provided to businesses and individuals located in the Eastern District of Texas.

250.   On information and belief, Amazon has directly infringed and continues to directly infringe the '230 patent by, among other things, making, using, offering for sale, and/or selling technology for selecting a background motion vector for a pixel in an occlusion region of an image, including but not limited to the Amazon '230 Products.

251.   On information and belief, the Amazon '230 Products comprise systems and methods for selecting a background motion vector for a pixel in an occlusion region of an image.

252.   On information and belief, the Amazon '230 Products determine the correct motion vector in occlusion regions, thereby reducing or eliminating artifacts of motion compensated image rate converters, which are referred to as "halos" in the display of video images.

253.   On information and belief, the Amazon '230 Products perform a method of selecting a background motion vector for a pixel in an occlusion region of an image comprising computing a model-based motion vector for the pixel on basis of a motion model being determined on basis of a part of a motion vector field of the image.

254.   On information and belief, the Amazon '230 Products perform a method of selecting a background motion vector for a pixel in an occlusion region of an image comprising comparing the model-based motion vector with each of the motion vectors of the set of motion vectors.

255.   On information and belief, the Amazon '230 Products perform a method of selecting a background motion vector for a pixel in an occlusion region of an image comprising selecting a particular motion vector of the set of motion vectors on basis of the comparing and for assigning the particular motion vector as the background motion vector.

256.   By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Amazon '230 Products, Amazon has injured Dynamic Data and is liable for directly infringing one or more claims of the '230 patent, including at least claim 6, pursuant to 35 U.S.C. § 271(a).

257.   On information and belief, Amazon also indirectly infringes the '230 patent by actively inducing infringement under 35 USC § 271(b).

258.   On information and belief, Amazon has had knowledge of the '230 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '230 patent and knew of its infringement, including by way of this lawsuit.

259.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '230 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '230 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the

'230 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '230 Products that have the capability of operating in a manner that infringe one or more of the claims of the '230 patent, including at least claim 6, and Amazon further provides documentation and training materials that cause customers and end users of the Amazon '230 Products to utilize the products in a manner that directly infringe one or more claims of the '230 patent.[32] By providing instruction and training to customers and end-users on how to use the Amazon '230 Products in a manner that directly infringes one or more claims of the '230 patent, including at least claim 6, Amazon specifically intended to induce infringement of the '230 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '230 Products, e.g., through Amazon user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '230 patent. Accordingly, Amazon has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '230 patent, knowing that such use constitutes infringement of the '230 patent.

260.   The '230 patent is well-known within the industry as demonstrated by multiple citations to the '230 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '230 patent without paying a reasonable royalty. Amazon is infringing the '230 patent in a manner best

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[32] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *Fire TV Stick*, AMAZON USER GUIDE; *Watching Video in 4K Ultra HD on Fire TV*, AMAZON HELP WEBSITE, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=201859000 (last visited Nov. 2018); *Amazon Fire TV*, AMAZON USER GUIDE.
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described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

261.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '230 patent.

262.   As a result of Amazon's infringement of the '230 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

<div align="center">

COUNT IX
INFRINGEMENT OF U.S. PATENT NO. 7,571,450

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263.   Dynamic Data references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

264.   Amazon designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for displaying information.

265.   Amazon designs, makes, sells, offers to sell, imports, and/or uses Amazon products containing digital display functionality, including: the Amazon Web Services platform (e.g., AWS Elastic Transcoder, AWS Elemental MediaConvert, AWS Elemental MediaLive, Amazon CloudFront); Amazon Fire TV products (e.g., Fire TV Stick 4k, Fire TV Cube, Fire TV (Gen 3), Fire TV (Gen 2), Fire TV Edition - Toshiba 4K (2018), Fire TV Edition - Element 4K (2018), Fire TV Edition - Insignia HD (2018), Fire TV Edition - Insignia 4k (2018), Fire TV Edition - Toshiba HD (2018)); and Amazon Fire Tablet products (e.g., (Fire HD 8 (2018), Fire HD 10 (2017), Fire HD 8 (2017), Fire 7 (2017), Fire HD 8 (2016), Fire (2015), Fire HD 8 (2015), Fire HD 10 (2015), Fire HDX 8.9 (2014), Fire HD 7 (2014), Fire HD 6 (2014), Kindle Fire HDX 8.9 (2013), Kindle

Fire HDX (2013), Kindle Fire HD (2013), Kindle Fire HD 8.9 (2012), Kindle Fire HD (2012), Kindle Fire (2012), Kindle Fire (2011)) (collectively, the "Amazon '450 Product(s)").

266.   On information and belief, one or more Amazon subsidiaries and/or affiliates use the Amazon '450 Products in regular business operations.

267.   On information and belief, one or more of the Amazon '450 Products include technology for displaying information.

268.   On information and belief, Amazon has directly infringed and continues to directly infringe the '450 patent by, among other things, making, using, offering for sale, and/or selling technology for displaying information, including but not limited to the Amazon '450 Products.

269.   On information and belief, one or more of the Amazon '450 Products enable methods and systems wherein a user does not need to make a new selection after being switched from one service to a second service.

270.   On information and belief, one or more of the Amazon '450 Products permit a user of an information display system to have selections made on a first service also presented when the user switches to a second service without requiring the user to browse through the menus to define the type of information to be displayed a second time.

271.   On information and belief, one or more of the Amazon '450 Products enable a user selection being made on the basis of the provided options while the first service was selected is use to select the appropriate data elements of the stream of the second service.

272.   On information and belief, one or more of the Amazon '450 Products enable various content sources to share similar information models.

273.   On information and belief, one or more of the Amazon '450 Products perform a method of displaying information on a display device wherein receiving a transport stream comprises services, with the services having elementary streams of video and of data elements.

274.   On information and belief, one or more of the Amazon '450 Products perform a method of displaying information on a display device wherein user actions of making a user selection of a type of information to be displayed on the device are received.

275.   On information and belief, one or more of the Amazon '450 Products perform a method of displaying information on a display device wherein filtering to select a data element of a first one of the services on the basis of the user selection is performed.

276.   On information and belief, one or more of the Amazon '450 Products perform a method of displaying information on a display device wherein rendering to calculate an output image to be displayed on the display device, on the basis of the first data element selected by the filer is performed.

277.   On information and belief, one or more of the Amazon '450 Products perform a method of displaying information on a display device wherein switching from the first one of the services to a second one of the services, characterized in comprising a second step of filtering to select a second data-element of the second one of the services, on basis of the user selection is performed.

278.   On information and belief, one or more of the Amazon '450 Products perform a method of displaying information on a display device wherein being switched from the first one of the services to the second one of the services, with the data-element and the second data-element being mutually semantically related and a second step of rendering to calculate the output image

to be displayed on the display device, on basis of the second data-element selected by the filter is performed.

279.   On information and belief, the Amazon '450 Products are available to businesses and individuals throughout the United States.

280.   On information and belief, the Amazon '450 Products are provided to businesses and individuals located in the Eastern District of Texas.

281.   By making, using, testing, offering for sale, and/or selling products and services for displaying information, including but not limited to the Amazon '450 Products, Amazon has injured Dynamic Data and is liable to the Plaintiff for directly infringing one or more claims of the '450 patent, including at least claim 8 pursuant to 35 U.S.C. § 271(a).

282.   On information and belief, Amazon also indirectly infringes the '450 patent by actively inducing infringement under 35 USC § 271(b).

283.   Amazon has had knowledge of the '450 patent since at least service of this Complaint or shortly thereafter, and on information and belief, Amazon knew of the '450 patent and knew of its infringement, including by way of this lawsuit.

284.   On information and belief, Amazon intended to induce patent infringement by third-party customers and users of the Amazon '450 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Amazon specifically intended and was aware that the normal and customary use of the accused products would infringe the '450 patent. Amazon performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '450 patent and with the knowledge that the induced acts would constitute infringement. For example, Amazon provides the Amazon '450 Products that have the capability of operating in a

manner that infringe one or more of the claims of the '450 patent, including at least claim 8, and Amazon further provides documentation and training materials that cause customers and end users of the Amazon '450 Products to utilize the products in a manner that directly infringe one or more claims of the '450 patent.[33] By providing instruction and training to customers and end-users on how to use the Amazon '450 Products in a manner that directly infringes one or more claims of the '450 patent, including at least claim 8, Amazon specifically intended to induce infringement of the '450 patent. On information and belief, Amazon engaged in such inducement to promote the sales of the Amazon '450 Products, e.g., through Amazon user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '450 patent. Accordingly, Amazon has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '450 patent, knowing that such use constitutes infringement of the '450 patent.

285. The '450 patent is well-known within the industry as demonstrated by multiple citations to the '450 patent in published patents and patent applications assigned to technology companies and academic institutions. Amazon is utilizing the technology claimed in the '450 patent without paying a reasonable royalty. Amazon is infringing the '450 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

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[33] *See, e.g.*, *Amazon Elastic Transcoder*, DEVELOPER GUIDE API VERSION 2012-09-25 (Nov. 17, 2016); *Amazon Web Services,* GENERAL REFERENCE VERSION 1.0 (2018); Lee Atkinson, *Delivering Media & Entertainment using the AWS Cloud*, AWS TRANSFORMATION DAY GERMANY PRESENTATION (Oct. 25, 2017); *Fire TV Stick*, AMAZON USER GUIDE; *Watching Video in 4K Ultra HD on Fire TV*, AMAZON HELP WEBSITE, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=201859000 (last visited Nov. 2018); *Amazon Fire TV*, AMAZON USER GUIDE; *Amazon Fire Tablet and Kindle E-Reader Quick Setup Guide*, AMAZON USER GUIDE (2014); *Fire & Kindle User's Guides*, Amazon Help Website, *available at*: https://www.amazon.com/gp/help/customer/display.html?nodeId=200317150 (last visited Nov. 2018).

286.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '450 patent.

287.   As a result of Amazon's infringement of the '450 patent, Dynamic Data has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Amazon's infringement, but in no event less than a reasonable royalty for the use made of the invention by Amazon together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

WHEREFORE, Dynamic Data respectfully requests that this Court enter:

A.   A judgment in favor of Dynamic Data that Amazon has infringed, either literally and/or under the doctrine of equivalents, the '073, '054, '918, '689, '177, '112, '529, '230, and '450, patents;

B.   An award of damages resulting from Amazon's acts of infringement in accordance with 35 U.S.C. § 284;

C.   A judgment and order finding that Amazon's infringement was willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate within the meaning of 35 U.S.C. § 284 and awarding to Dynamic Data enhanced damages.

D.   A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Dynamic Data its reasonable attorneys' fees against Amazon.

E.   Any and all other relief to which Dynamic Data may show themselves to be entitled.

JURY TRIAL DEMANDED

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Dynamic Data Technologies,

LLC requests a trial by jury of any issues so triable by right.

DYNAMIC DATA COMPLAINT FOR PATENT INFRINGEMENT

Dated: November 2, 2018

Respectfully submitted,

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